



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mahendra K. Sunkara et al. )  
Filed: September 16, 2003 ) Examiner: Luk, Emmanuel S.  
Serial No: 10/664,072 ) Group Art Unit: 1722  
For: DIRECT SYNTHESIS OF OXIDE )  
NANOSTRUCTURES OF LOW-MELTING METALS )  
Atty. Docket No.: AD138/2001 )

Mail Stop Amendment  
Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-150

**CERTIFICATE OF MAILING  
UNDER 37 CFR 1.8**

THE UNDERSIGNED CERTIFIES THAT THIS DOCUMENT IS BEING PLACED IN AN ENVELOPE  
ADDRESSED TO COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA. 22313-1450, AND  
DEPOSITED AS FIRST CLASS MAIL, POSTAGE PREPAID, THIS 17 DAY OF May 2006.

D. Carrithers  
(Typed or Printed Name)  
D. Carrithers  
(Signature)

**INFORMATION DISCLOSURE DOCUMENT**

Enclosed is a list and copies of references considered by Applicant to be pertinent in the examination of the above-identified patent application.

Applicant submits this Information Disclosure Statement in accordance with the duty of disclosure under 37CFR §1.56 and 1.97-1.98. This Statement is filed in accordance with 37 CFR §1.97(b)(4), prior to issuance of a First Office after the filing of a request for continued examination under §1.114.

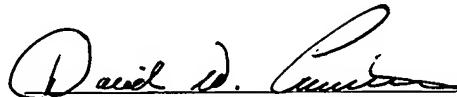
A check for the RCE fee is enclosed herewith. Please charge any under payments or credit any overpayments to Counsel's Deposit Account No. 50-0642.

Applicants(s) submitted herewith patents, publications or other information of which they are aware, which they believe may be material to the examination of this application and in respect of which there may be a duty to disclose in accordance with 37 CFR 1.56.

While this Information Disclosure Statement may be "material" pursuant to 37 CFR 1.56 it is not intended to constitute an admission that any patent, publication or other information referred to therein is "Prior art" for this invention unless specifically designated as such.

In accordance with 37 CFR 1.97(b) the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56 (a) exists.

Respectfully submitted,



David W. Carrithers  
CARRITHERS LAW OFFICE, PLLC  
One Paragon Centre  
6060 Dutchman's Lane, Suite 140  
Louisville, KY 40205  
Telephone (502) 452-1233  
Reg. No. 35,475



PTO/SB/08A (05-23)

MAY 22 200

• 100 •

Approved for use through 05/31/2003. OMB 0651-0031  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Substitute for form 1449A/PTO		Complete if Known	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>		Application Number	10/664,072
		Filing Date	September 16, 2003
		First Named Inventor	Mahendra Kumar Sunkara
		Art Unit	1722
		Examiner Name	Emmanuel S. Luk
Sheet	1	of	Attorney Docket Number
		AD138/2001	

**U.S. PATENT DOCUMENTS**

## FOREIGN PATENT DOCUMENTS

**OTHER PRIOR ART (Including Author, Title, Date Pertinent Pages, ETC.)**

Publication No. WO026422A1 for "HIGH PURITY GALLIUM FOR PREPARATION OF COMPOUND SEMICONDUCTOR, AND METHOD AND APPARATUS FOR PURIFYING THE SAME" by Yamamura et al., published on May 11, 2000

Publication NO. WO9965068A1 for "FABRICATION OF GALLIUM NITRIDE SEMICONDUCTOR LAYERS BY LATERAL GROWTH FROM TRENCH SIDEWALLS" by Zheleva et al., published on December 16, 1999

Publication No. WO9944224A1 for "METHOD OF FABRICATING GALLIUM NITRIDE SEMICONDUCTOR LAYERS BY LATERAL OVERGROWTH THROUGH MASKS, AND GALLIUM NITRIDE SEMICONDUCTOR STRUCTURES FABRICATED THEREBY" by Davis et al., published on September 2, 1999

Y.F. Zhang, Y.H. Tang, N. Wang, C.S. Lee, I. Bello, S.T. Lee "ONE DIMENSIONAL GROWTH MECHANISM OF CRYSTALLINE SILICON NANOWIRES," Journal of Crystal Growth 197 (1999) 136-140

J. Westwater, D.P. Gosain, S. Tomiya, S. Usui, and H. Ruda "GROWTH OF SILICON NANOWIRES VIA GOLD/SILANE VAPOR-LIQUID-SOLID REACTION," J. Vac. Sci. Technol. B 15(3), May/June 1997, 554-557

A.M. Morales and C.M. Lieber "A LASER ABLATION METHOD FOR THE SYNTHESIS OF CRYSTALLINE SEMICONDUCTOR NANOWIRES," Science, Vol. 279, January 9, 1998, 208-211

H.F. Yan, Y.J. Xing, Q.L. Hang, D.P. Yu, Y.P. Wang, J. Xu, Z.H. Xi, S.Q. Feng "GROWTH OF AMORPHOUS SILICON NANOWIRES VIA A SOLID-LIQUID-SOLID MECHANISM," Chemical Physics Letters 323 (2000) 224-228

J.L. Gole and J.D. Stout, W.L. Rauch and Z.L. Wang "DIRECT SYNTHESIS OF SILICON NANOWIRES, SILICA NANOSPHERES, AND WIRE-LIKE NANOSPHERE AGGLOMERATES," Applied Physics Letters, Vol. 76, Number 17, 24 April 2000, 2346-2348

J.D. Holmes, K.P. Johnston, R.C. Doty, B.A. Korgel "CONTROL OF THICKNESS AND ORIENTATION OF SOLUTION-GROWN SILICON NANOWIRES," Science, Vol. 287, February 25, 2000, 1471-1473

P. Scheier, J. Marsen, M. Lonfat, W. Schneider, K. Sattler "GROWTH OF SILICON NANOSTRUCTURES ON GRAPHITE," Surface Science 458 (2000, 113-122)

D.P. Yu, Z.G. Bai, Y. Ding, Q. L. Hang, H.Z. Zhang, J.J. Wang, Y.H. Zou, W. Qian, G.C. Xiong, H.T. Zhou, and S.Q. Feng "NANOSCALE SILICON WIRES SYNTHESIZED USING SIMPLE PHYSICAL EVAPORATION," Applied Physics Letters, Vol. 72, Number 26, June 29, 1998, 3458-3460

Sharma et al. "NOVEL VAPOR-LIQUID-SOLID SYNTHESIS METHOD FOR CARBON NANOSTRUCTURES," presented on CD and at Carbon2001 Conference at the University of Kentucky, Lexington, KY in July of 2001

Zhang et al. "MORPHOLOGY AND GROWTH MECHANISM STUDY OF SELF-ASSEMBLED SILICON NANOWIRES SYNTHESIZED BY THERMAL EVAPORATION," Chemical Physics Letters 337 (2001) 18-24, March 30, 2001

Wu et al. "GERMANIUM NANOWIRE GROWTH VIA SIMPLE VAPOR TRANSPORT," Chem. Mater. 2000, 12, 605-607.

Y. F. Zhang, Y.H. Tanh, N. Wang, D.P. Yu, C.S. Lee, I. Bello, and S.T. Lee "SILICON NANOWIRES PREPARED BY LASER ABLATION AT HIGH TEMPERATURE," Applied Physics Letters, Vol. 72, Number 15, April 13, 1998, 1835-1837

D.P. Yu, Y.J. Xing, Q.L. Hang, H.F. Yan, J. Xu, Z.H. Xi, S.Q. Feng "CONTROLLED GROWTH OF ORIENTED AMORPHOUS SILICON NANOWIRES VIA A SOLID-LIQUID-SOLID (SLS) MECHANISM," Physica E 9 (2001) 305-309

Lieber, "ONE DIMENSIONAL NANOSTRUCTURES: CHEMISTRY, PHYSICS & APPLICATIONS," Solid State Communications, Vol. 107, No. 11, 607-616

C.H. Liang, G.W. Meng, G.Z. Wang, Y.W. Wang, L.D. Zhang, and S.Y. Zhang, "CATALYTIC SYNTHESIS AND PHOTOLUMINESCENCE OF  $\text{Ga}_2\text{O}_3$  NANOWIRES" Appl. Phys. Lett. 78, 3202 (2001).

Y.C. Choi, W.S. Kim, Y.S. Park, S.M. Lee, D.J. Bae, Y.H. Lee, G-S Park, W.B. Choi, N.S. Lee and J.M. Kim, "CATALYTIC GROWTH OF  $\text{Ga}_2\text{O}_3$  NANOWIRES BY ARC DISCHARGE" Adv. Mater. 12, 746 (2000).

W.Q. Han, P. Kohler-Redlich, F. Ernest, and M. Ruhle, "GROWTH AND MICROSTRUCTURE OF  $\text{Ga}_2\text{O}_3$  NANORODS" Solid State Commun. 115, 527 (2000).

J.Q. Hu, X.L. Ma, N.G. Shang, Z.Y. XIE, N.B. Wong, C.S. Lee, and S.T. Lee, "LARGE-SCALE RAPID OXIDATION SYNTHESIS OF  $\text{SnO}_2$  NANORIBBONS" J. Phys. Chem. B 106, 3823 (2002).

X.S. Peng, Y.W. Wang, J. Zhang, X.F. Wang, L.X. Zhao, G.W. Meng, and L.D. Zhang, "LARGE SCALE SYNTHESIS OF  $\text{In}_2\text{O}_3$  NANOWIRES" Appl. Phys. A 74, 437 (2002).

G. Gundiah, A. Govindaraj, and C.N.R. Rao, "NANOWIRES, NANOBELTS AND RELATED NANOSTRUCTURES OF  $\text{Ga}_2\text{O}_3$ " Chem. Phys. Lett. 351, 189 (2002).

S. Sharma and M.K. Sunkara, "DIRECT SYNTHESIS OF GALLIUM OXIDE TUBES, NANOWIRES, AND NANOPAINTBRUSHES" The Journal of the American Chemical Society, 124, 12288-12293, (In Press, 2002).

Z.R. Dai, Z.W. Pan, and Z.L. Wang, "GALLIUM OXIDE NANORIBBONS AND NANOSHEETS" J. Phys. Chem. B 106, 902-904 (2002).

M.H. Huang, Y. Wu, H. Feick, N. Tran, E. Weber, and P. Yang, "CATALYTIC GROWTH OF ZINC OXIDE NANOWIRES BY VAPOR TRANSPORT" Adv. Mater. 13, 113 (2001).

Examiner Signature		Date Considered
-----------------------	--	--------------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of US PTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*